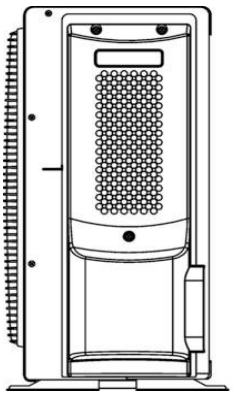
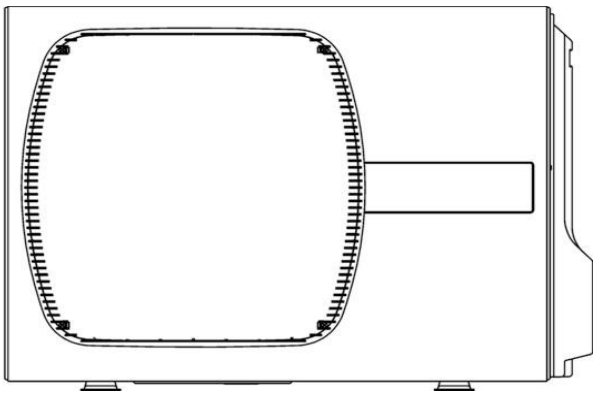
# TECHNICAL DATA
# & SERVICE MANUAL

**OUTDOOR UNIT:** **GR9FI50R5IAA**
**GR9FI50R5IAB**

## DUAL SPLIT SYSTEM AIR CONDITIONER

| Model No. | Product Code No. |
|---|---|
| GR9FI50R5IAA | 38.7107.098 |
| GR9FI50R5IAB | 38.7107.103 |





0.8180.597.01 04/2011

## IMPORTANT!
## Please read before installation

This air conditioning system meets strict safety and operating standards.
For the installer or service person, it is important to install or service the system so that it operates safely and efficiently.

**For safe installation and trouble-free operation, you must:**
- Carefully read this instruction booklet before beginning.
- Follow each installation or repair step exactly as shown.
- Observe all local, state and national electrical codes.
- Pay close attention to all warning and caution notices given in this manual.

•The unit must be supplied with a dedicated electrical line.

**WARNING**

This symbol refers to a hazard or unsafe practice which can result in severe personal injury or death.

**CAUTION**

This symbol refers to a hazard or unsafe practice which can result in personal injury or product or property damage.

**If necessary, get help**
These instructions are all you need for most installation sites and maintenance conditions.
If you require help for a special problem, contact our sale/service outlet or your certified dealer for additional instructions.

**In case of improper installation**
The manufacturer shall in no way be responsible for improper installation or maintenance service, including failure to follow the instructions in this document.

**SPECIAL PRECAUTIONS**

- During installation, connect before the refrigerant system and then the wiring one; proceed in the reverse orden when removing the units.

**WARNING** **When wiring**

**ELECTRICAL SHOCK CAN CAUSE SEVERE PERSONAL INJURY OR DEATH. ONLY A QUALIFIED, EXPERIENCED ELECTRICIANS SHOULD ATTEMPT TO WIRE THIS SYSTEM.**

- Do not supply power to the unit until all wiring and tubing are completed or reconnected and checked, to ensure the grounding.
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring.
  Improper connections and inadequate grounding can cause **accidental injury and death**.
- **Ground the unit** following local electrical codes.
- The Yellow/Green wire cannot be used for any connection different from the ground connection.
- Connect all wiring tightly. Loose wiring may cause overheating at connection points and a possible fire hazard.
- Do not allow wiring to touch the refrigerant tubing, compressor, or any moving parts of the fan.
- Do not use multi-core cable when wiring the power supply and control lines. Use separate cables for each type of line.

**When transporting**
Be careful when picking up and moving the indoor and outdoor units. Get a partner to help, and bend your knees when lifting to reduce strain on your back. Sharp edges or thin aluminium fins on the air conditioner can cut your fingers.

**When installing...**
**... In a ceiling or wall**
Make sure the ceiling/wall is strong enough to hold the unit-weight. It may be necessary to build a strong wooden or metal frame to provide added support.

**... In a room**
Properly insulate any tubing run inside a room to prevent "sweating", which can cause dripping and water damage to walls and floors.

**... In moist or uneven locations**
Use a raised concrete base to provide a solid level foundation for the outdoor unit.
This prevents damage and abnormal vibrations.

**... In area with strong winds**
Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.

**... In a snowy area (for heat pump-type systems)**
Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.

**When connecting refrigerant tubing**
- Keep all tubing runs as short as possible.
- Use the flare method for connecting tubing.
- Apply refrigerant lubricant to the matching surfaces of the flare and union tubes before connecting them; screw by hand and then tighten the nut with a torque wrench for a leak-free connection.
- Check carefully for leaks before starting the test run.

**NOTE:**
Depending on the system type, liquid and gas lines may be either narrow or wide. Therefore, to avoid confusion, the refrigerant tubing for your particular model is specified as narrow tube for liquid, wide tube for gas.

**When servicing**
- Turn the power OFF at the main power board before opening the unit to check or repair electrical parts and wiring.
- Keep your fingers and clothing away from any moving parts.
- Clean up the site after the work, remembering to check that no metal scraps or bits of wiring have been left inside the unit being serviced.
- Ventilate the room during the installation or testng the refrigeration system; make sure that, after the installation, no gas leaks are present, because this could produce toxic gas and dangerous if in contact with flames or heat-sources.

0.8180.531.00 05/2007

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# 1. OPERATING RANGE

| GR9FI50R5IAA<br>GR9FI50R5IAB | | | |
|---|---|---|---|
| | **Temperature** | **Indoor Air Intake Temp.** | **Outdoor Air Intake Temp.** |
| Cooling | Maximum | 32°C D.B. / 23°C W.B. | 43°C D.B. |
| | Minimum | 10°C D.B. / 6°C W.B. | -15°C D.B. |
| Heating | Maximum | 27°C D.B. | 24°C D.B. / 18°C W.B. |
| | Minimum | 5°C D.B. | -15°C D.B. |

# 2. SPECIFICATIONS

## 2-1 Unit Specifications

| | GR9FI50R5IAA | GR9FI50R5IAB |
|---|---|---|
| **Power source** | 220 - 240 V ~ 50 Hz | |
| **Voltage rating** | 230 V | |

| **Performance *** | **MTAF(B)IA0R5I x2** | | **Cooling** | **Heating** | **Cooling** | **Heating** |
|---|---|---|---|---|---|---|
| Capacity | | **kW** | 4,45 | 5,00 | 4,55 | 5,19 |
| | | **BTU/h** | 15184 | 17061 | 15525 | 17709 |
| Air circulation (High) | | **m³/h** | 600 | | | |
| Moisture removal (High) | | **Liters/h** | 1,5 | - | 1,5 | - |

| **Electrical Rating** | | **Cooling** | **Heating** | **Cooling** | **Heating** |
|---|---|---|---|---|---|
| Available voltage range | **V** | 198 ~ 264 | | | |
| Running amperes | **A** | 6,10 | 5,20 | 6,00 | 5,30 |
| Power input | **W** | 1382 | 1180 | 1360 | 1210 |
| Power factor | **%** | 99 | 99 | 99 | 99 |
| C.O.P. | **W/W** | 3,22 | 4,24 | 3,35 | 4,29 |
| Compressor locked rotor amperes | **A** | - | - | - | - |

| **Features** | | | | |
|---|---|---|---|---|
| Fan speed | | | Variable ( 200÷800 continuous ) | |
| Compressor | | | Rotary (Hermetic) DC inv. | Twin Rotary (Hermetic) DC inv. |
| Refrigerant / Amount charged at shipment | | **g** | R410A / 1300 | R410A / 1300 |
| Refrigerant control | | | Electronic expansion valve | |
| Power noise level | **Hi** | **dB-A** | 59 | 58 |
| Refrigerant tubing connections | | | Flare type | |
| Max. allowable tubing length at shipment | | **m** | see installation instruction | |
| Refrigerant tube diameter | **Narrow tube** | **mm(in.)** | 6,35 (1/4) | |
| | **Wide tube** | **mm(in.)** | 9,52 (3/8) | |

| **Dimensions & Weight** | | | |
|---|---|---|---|
| Unit dimensions | **Height** | **mm** | 630 |
| | **Width** | **mm** | 830 |
| | **Depth** | **mm** | 345 |
| Package dimensions | **Height** | **mm** | 710 |
| | **Width** | **mm** | 990 |
| | **Depth** | **mm** | 410 |
| Weight | **Net** | **kg** | 56,5 |
| | **Shipping** | **kg** | 61,5 |
| Shipping volume | | **m³** | 0,29 |

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**Remarks:**

Rating Conditions are:

Cooling: Indoor Air Temperature 27°C D.B. / 19°C W.B.
Outdoor Air Temperature 35°C D.B. / 24°C W.B.

Heating: Indoor Air Temperature 20°C D.B.
Outdoor Air Temperature 7°C D.B. / 6°C W.B.

* For other INDOOR UNITS' MODELS, please refer to catalogue

## 2-2 Major Component Specifications

| | | | | | GR9FI50R5IAA | GR9FI50R5IAB |
|---|---|---|---|---|---|---|
| **Compressor** | | | | | | |
| | Type | | | | Rotary (Hermetic) DC inv. | Twin Rotary (Hermetic) DC inv. |
| | Compressor model | | | | G4B135LUBJH | SNB130FGBMT |
| | Nominal input (compressor rating condition) | | | W | 1324 | 1140 |
| | Compressor oil…Amount | | | cc | FREOLα68ES-T / RB68EP ..... 600 | FV50S ……350 |
| | Coil resistance (Ambient temp. 20°C) | | | Ω | 0,64 | 0,98 |
| | Overload relay | | | | Software Protection | |
| | Safety devices | **Type** | | | - | - |
| | | **Operating Temp.** | **Open** | °C | - | - |
| | | | **Close** | °C | - | - |
| **Controller PCB** | | | | | | |
| | Part No. | | | | SAC DCI ODU | |
| | Controls | | | | Microprocessor | |
| | Control circuit fuse | | | | 6,3x32 - 10A | |
| **Expansion PCB** | | | | | | |
| | Part No. | | | | SAC DCI ESP DUAL | |
| | Controls | | | | --- | |
| | Control circuit fuse | | | | --- | |
| **Fan & Fan Motor** | | | | | | |
| | Type | | | | Propeller | |
| | Q'ty ……. Ø | | | Nr. ... mm | 1…. Ø 400 | |
| | Fan motor model…Q'ty | | | | P35810 P0012 | |
| | No. Of poles…rpm | | | | 8 ... variable ( 200 ÷ 800 ) | |
| | Nominal output | | | W | 20 | |
| | Coil resistance (Ambient temp. 25 °C ) | | | Ω | BRN-BLK: 210 | |
| | | | | Ω | YEL-BLK: 210 | |
| | | | | Ω | BRN-YEL: 210 | |
| | Safety devices | **Type** | | | - | |
| | | **Operating temp.** | **Open** | °C | - | |
| | | | **Close** | °C | - | |
| | | | | | | |
| **Heat Exch. Coil** | | | | | | |
| | Coil | | | | Aluminium plate fin / Copper tube | |
| | Rows | | | | 3 | 2 |
| | Fin pitch | | | mm | 1,4 | 1,5 |
| | Face area | | | $m^2$ | 0,37 | 0,47 |
| **External Finish** | | | | | Acrylic baked-on enamel finish | |

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## 2-3 Other Component Specifications

| | | GR9FI50R5IAA | GR9FI50R5IAB |
|---|---|---|---|
| **4-way Valve (20S)** | | **SQ-136 (Coil) - SHF-4H-23U (Valve)** | **SQ-136 (Coil) - SHF-7K-34U (Valve)**<br>**STF-..J514.. (coil) - STF-0202G (valve)** |
| Coil rating | | AC 220/240 V, 50 Hz | |
| Coil resistance | **Ω (at 20°C)** | 1440 ± 5% | |
| **Electronic Expansion Valve** | | **CAM-MD12EX(Coil) ZCAM-BD15EX (Valve)** | |
| Coil rating | | DC 12 V | |
| Coil resistance / phase | **Ω (at 20°C)** | 46 ± 4% | |
| **Defrost Valve** | | **FQ-235-RK (Coil) FDF6A-049-RK (Valve)** | |
| Coil rating | | AC 220/240 V - 50 Hz | |
| Coil resistance | **Ω (at 20°C)** | 1273 ± 10% | |
| **Thermistor (coil sensor)** | | **NTC-THERMISTOR** | |
| Resistance | **kΩ** | 10 at 25 °C | |
| **Thermistor (compressor disch. sen.)** | | **NTC-THERMISTOR** | |
| Resistance | **kΩ** | 10 at 25 °C | |
| **Thermistor (inlet air sensor)** | | **NTC-THERMISTOR** | |
| Resistance | **kΩ** | 10 at 25 °C | |
| **Thermistor (wide tube A sensor)** | | **NTC-THERMISTOR** | |
| Resistance | **kΩ** | 10 at 25 °C | |
| **Thermistor (narrow tube A sensor)** | | **NTC-THERMISTOR** | |
| Resistance | **kΩ** | 10 at 25 °C | |
| **Thermistor (wide tube B sensor)** | | **NTC-THERMISTOR** | |
| Resistance | **kΩ** | 10 at 25 °C | |
| **Thermistor (narrow tube B sensor)** | | **NTC-THERMISTOR** | |
| Resistance | **kΩ** | 10 at 25 °C | |
| **Crank case heater** | | **30 W RESISTANCE** | |
| Resistance | **Ω (at 20°C)** | 1760 ± 10% | |
| **Base heater** | | **75W FLEXELEC CSC2** | |
| Resistance | **Ω (at 20°C)** | 705 ± 10% | |

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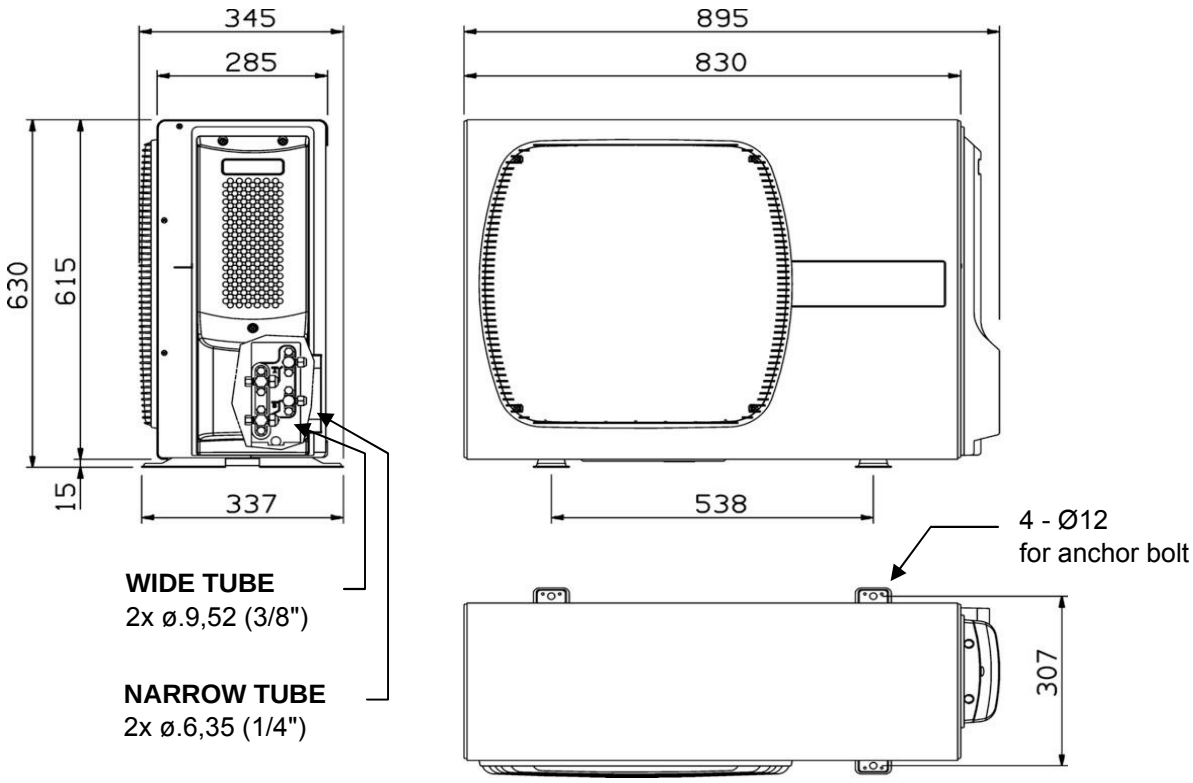
## 3. DIMENSIONAL DATA

### GR9FI50R5IAA
### GR9FI50R5IAB

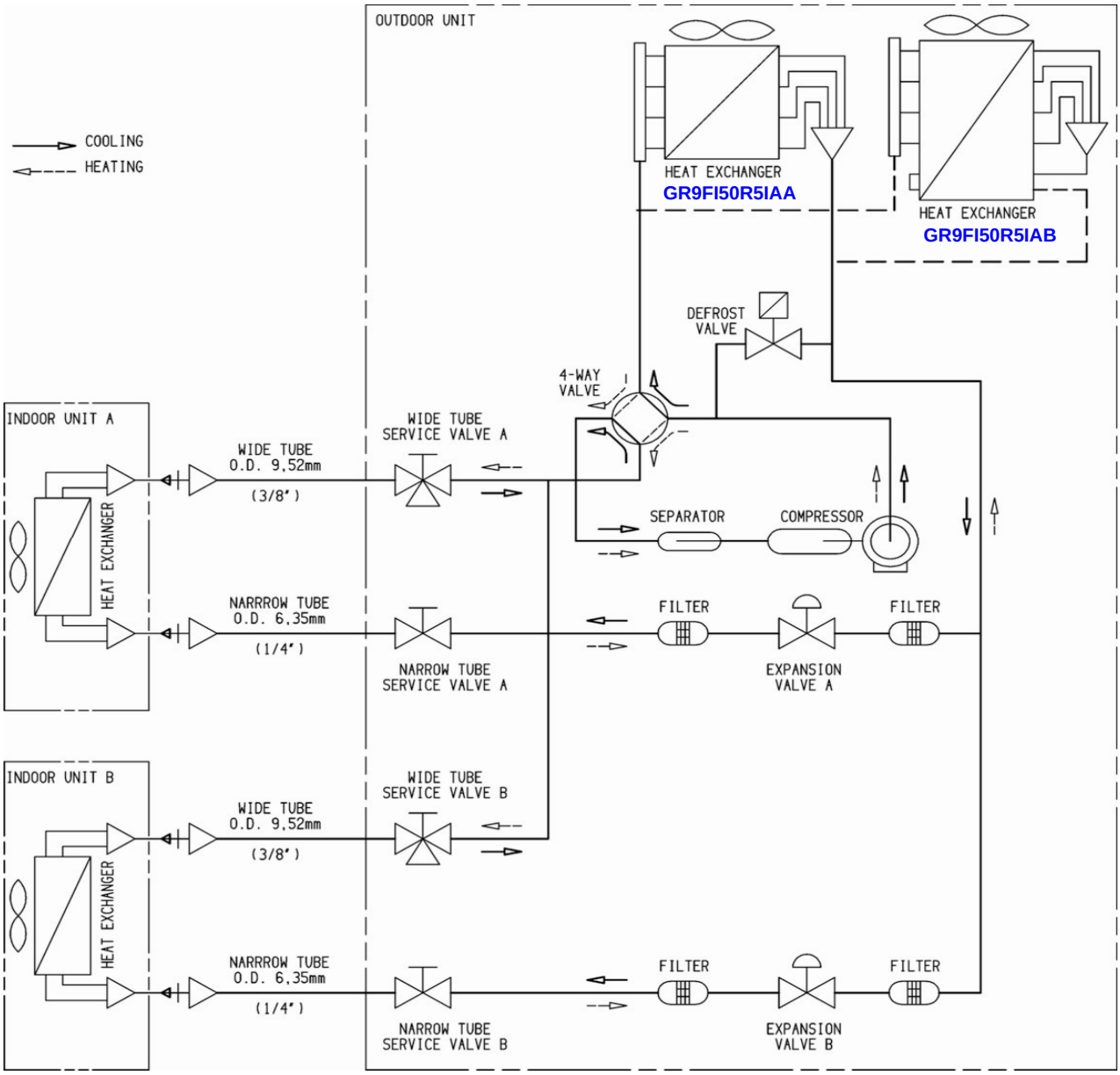



dimension [mm]

# 4. REFRIGERANT FLOW DIAGRAM

## 4-1 Dual Split System Refrigerant Flow Diagram

Outdoor Unit: **GR9FI50R5IAA** Indoor Unit: **MTAF(B)IA0R5I x2**
**GR9FI50R5IAB** **MTAF(B)IA0R5I x2**



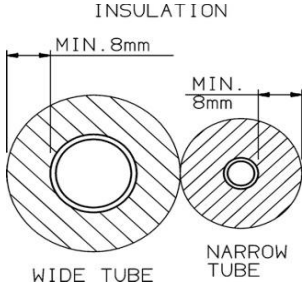

### Insulation of Refrigerant Tubing

**IMPORTANT**

Because expansion valve is used in the outdoor unit, both the wide and narrow tubes of this air conditioner become cold. To prevent heat loss and wet floors due to dripping of condensation, both tubes must be well insulated with a proper insulation material.
The thickness of the insulation should be a min. 8mm.

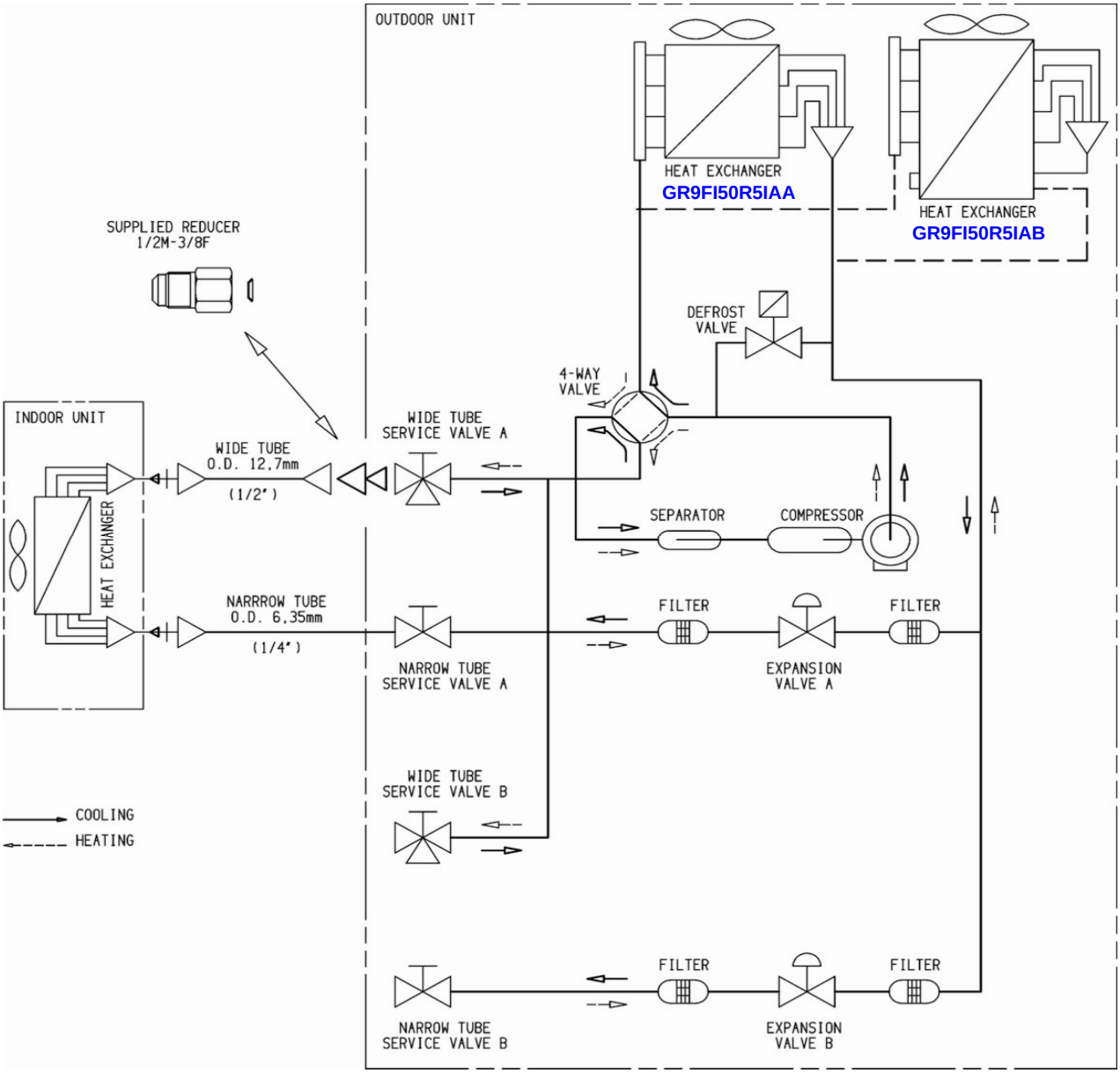
**CAUTION**

After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack.



## 4-2 Mono Split System Refrigerant Flow Diagram

Outdoor Unit: **GR9FI50R5IAA** Indoor Unit: **MPA9FIB0R5I x1**
**GR9FI50R5IAB** **MPA9FIB0R5I x1**



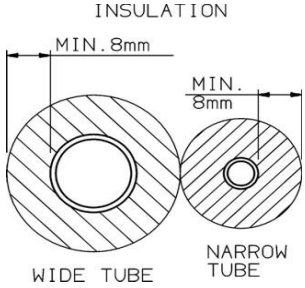

### Insulation of Refrigerant Tubing

**IMPORTANT**

Because expansion valve is used in the outdoor unit, both the wide and narrow tubes of this air conditioner become cold. To prevent heat loss and wet floors due to dripping of condensation, both tubes must be well insulated with a proper insulation material.
The thickness of the insulation should be a min. 8mm.

**CAUTION**

After a tube has been insulated, never try to bend it into a narrow curve because it can cause the tube to break or crack.

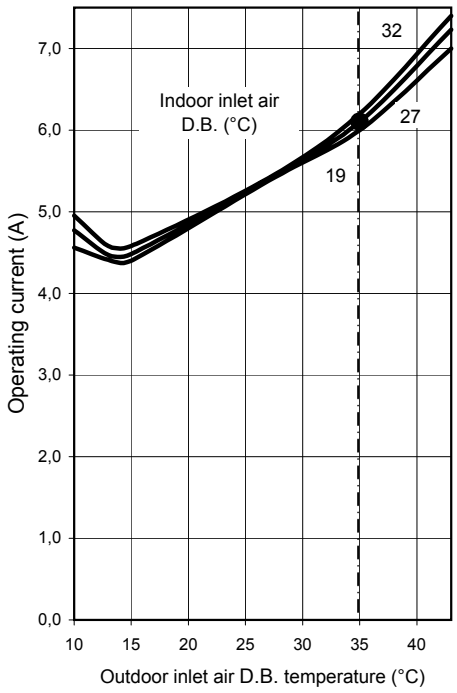


# 5. PERFORMANCE DATA

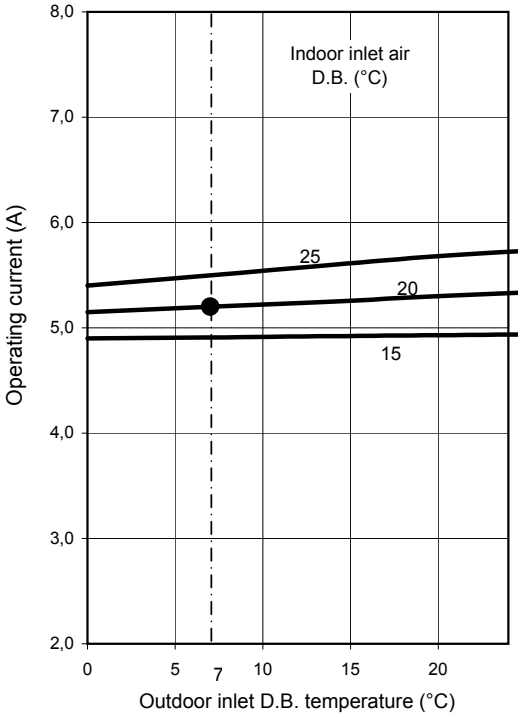
## 5-1 Performance charts

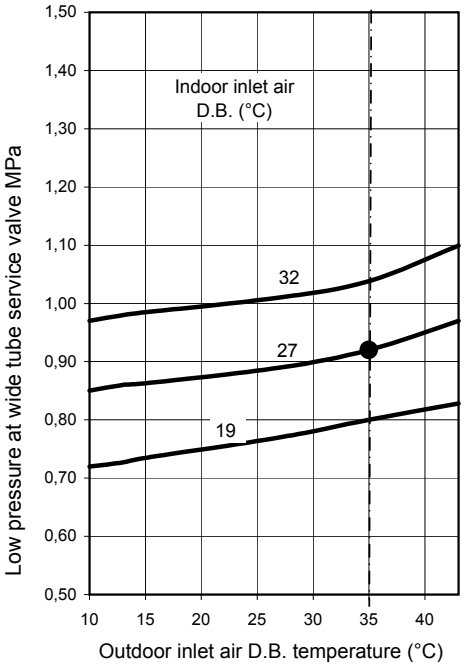
## GR9FI50R5IAA

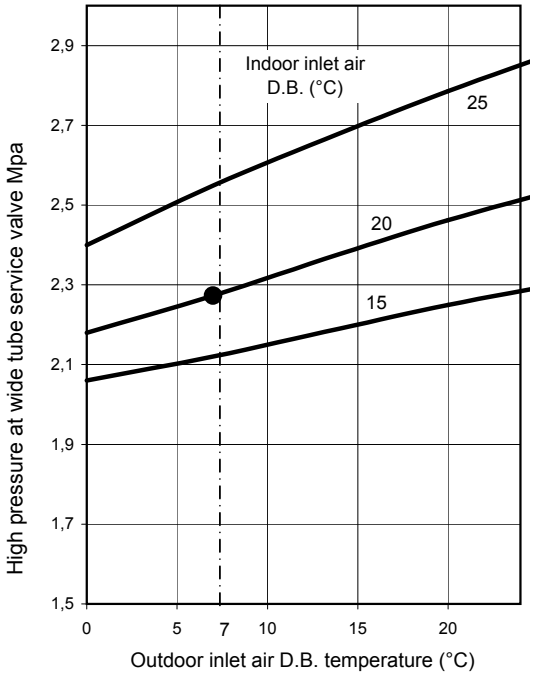
■ Cooling Characteristics




■ Heating Characteristics



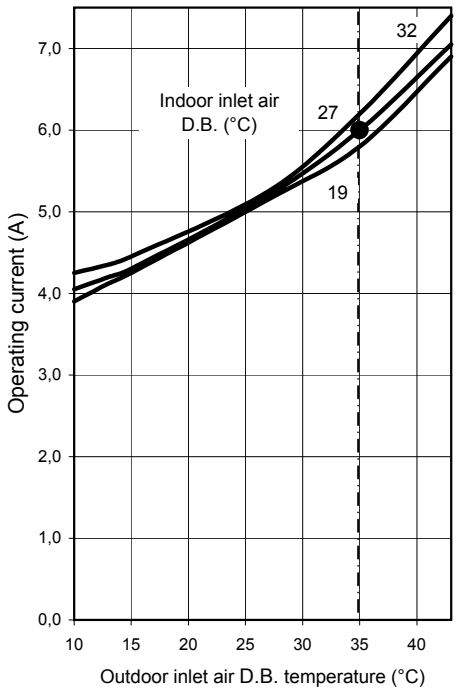

**Note**

Overload prevention operates to protect the air conditioner when outdoor ambient temperature reaches extremely high values in heating mode.

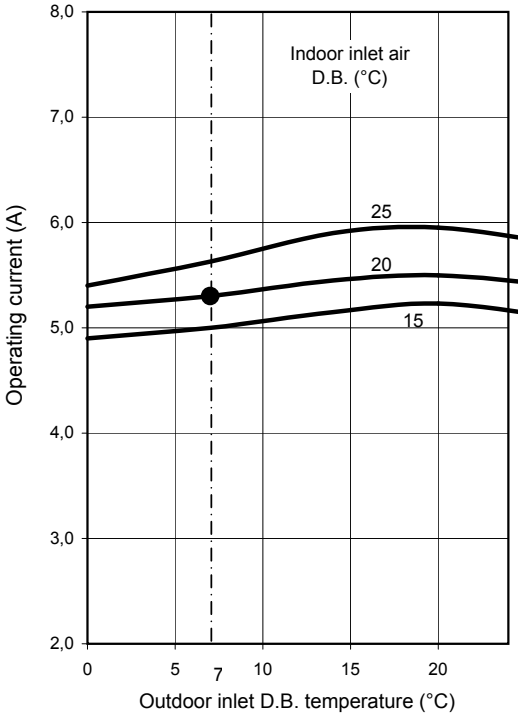
● Points of Rating condition Data referred to **MTAF(B)IA0R5I x2**

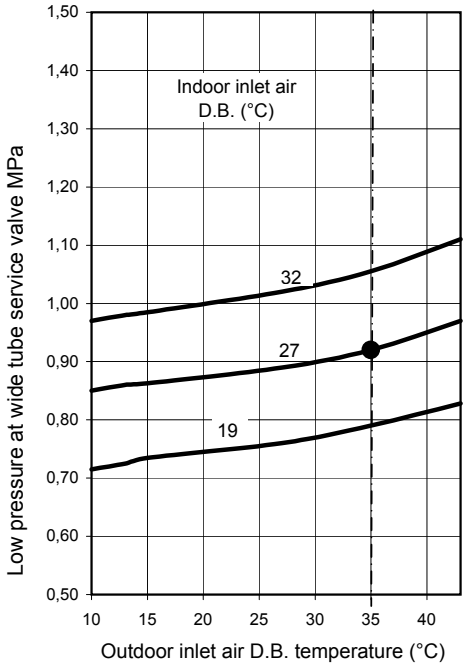
## GR9FI50R5IAB

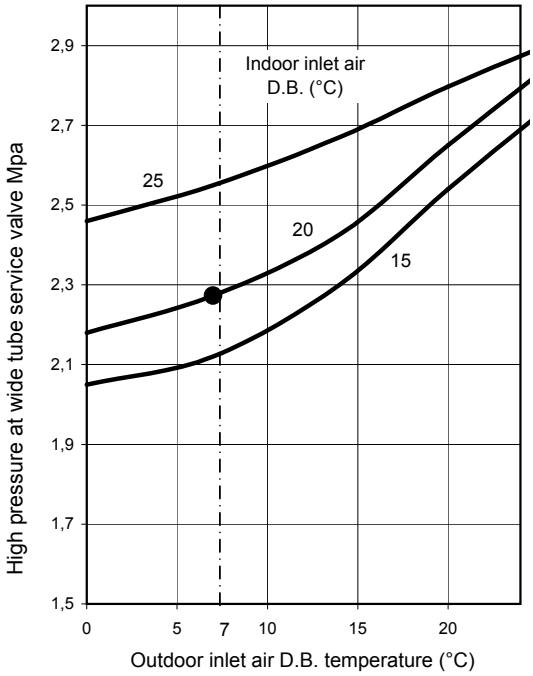
■ Cooling Characteristics




■ Heating Characteristics




**Note**

Overload prevention operates to protect the air conditioner when outdoor ambient temperature reaches extremely high values in heating mode.

● Points of Rating condition Data referred to **MTAF(B)IA0R5I x2**

# 6. ELECTRICAL DATA

## 6-1 Electrical characteristics

## GR9FI50R5IAA

**COOLING**

| | | | 2 Indoor Unit | Outdoor unit | Complete Unit |
|---|---|---|---|---|---|
| | | | Fan Motor | Fan Motor + Compressor | |
| Performance at | | | 230 V - 1 Phase - 50 Hz | | |
| Rating conditions | Running Amps. | A | 0,26 | 5,84 | 6,1 |
| | Power input | kW | 0,062 | 1,320 | 1,382 |

Rating Conditions: Indoor Air Temperature 27°C D.B. / 19°C W.B.
Outdoor Air Temperature 35°C D.B. / 24°C W.B.

**HEATING**

| | | | 2 Indoor Unit | Outdoor unit | Complete Unit |
|---|---|---|---|---|---|
| | | | | Fan Motor + Compressor | |
| Performance at | | | 230 V - 1 Phase - 50 Hz | | |
| Rating conditions | Running Amps. | A | 0,26 | 4,94 | 5,2 |
| | Power input | kW | 0,062 | 1,118 | 1,180 |

Rating Conditions: Indoor Air Temperature 20°C D.B.
Outdoor Air Temperature 7°C D.B. / 6°C W.B.

NOTE: Data referred to **2** indoor unit, **MTAF(B)IA0R5I x2**
For other indoor unit models there could be some differences.

## GR9FI50R5IAB

**COOLING**

| | | | 2 Indoor Unit | Outdoor unit | Complete Unit |
|---|---|---|---|---|---|
| | | | Fan Motor | Fan Motor + Compressor | |
| Performance at | | | 230 V - 1 Phase - 50 Hz | | |
| Rating conditions | Running Amps. | A | 0,26 | 5,74 | 6,0 |
| | Power input | kW | 0,062 | 1,298 | 1,360 |

Rating Conditions: Indoor Air Temperature 27°C D.B. / 19°C W.B.
Outdoor Air Temperature 35°C D.B. / 24°C W.B.

**HEATING**

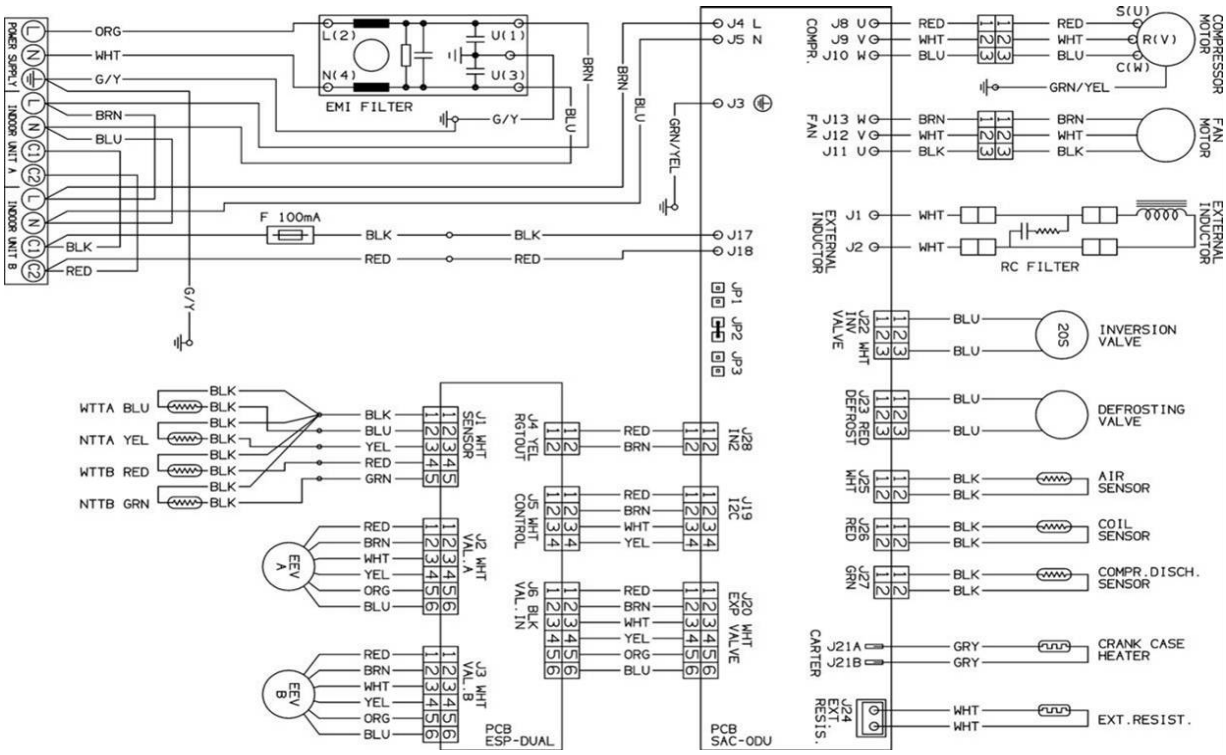
| | | | 2 Indoor Unit | Outdoor unit | Complete Unit |
|---|---|---|---|---|---|
| | | | | Fan Motor + Compressor | |
| Performance at | | | 230 V - 1 Phase - 50 Hz | | |
| Rating conditions | Running Amps. | A | 0,26 | 5,04 | 5,3 |
| | Power input | kW | 0,062 | 1,148 | 1,210 |

Rating Conditions: Indoor Air Temperature 20°C D.B.
Outdoor Air Temperature 7°C D.B. / 6°C W.B.

NOTE: Data referred to **2** indoor unit, **MTAF(B)IA0R5I x2**
For other indoor unit models there could be some differences.

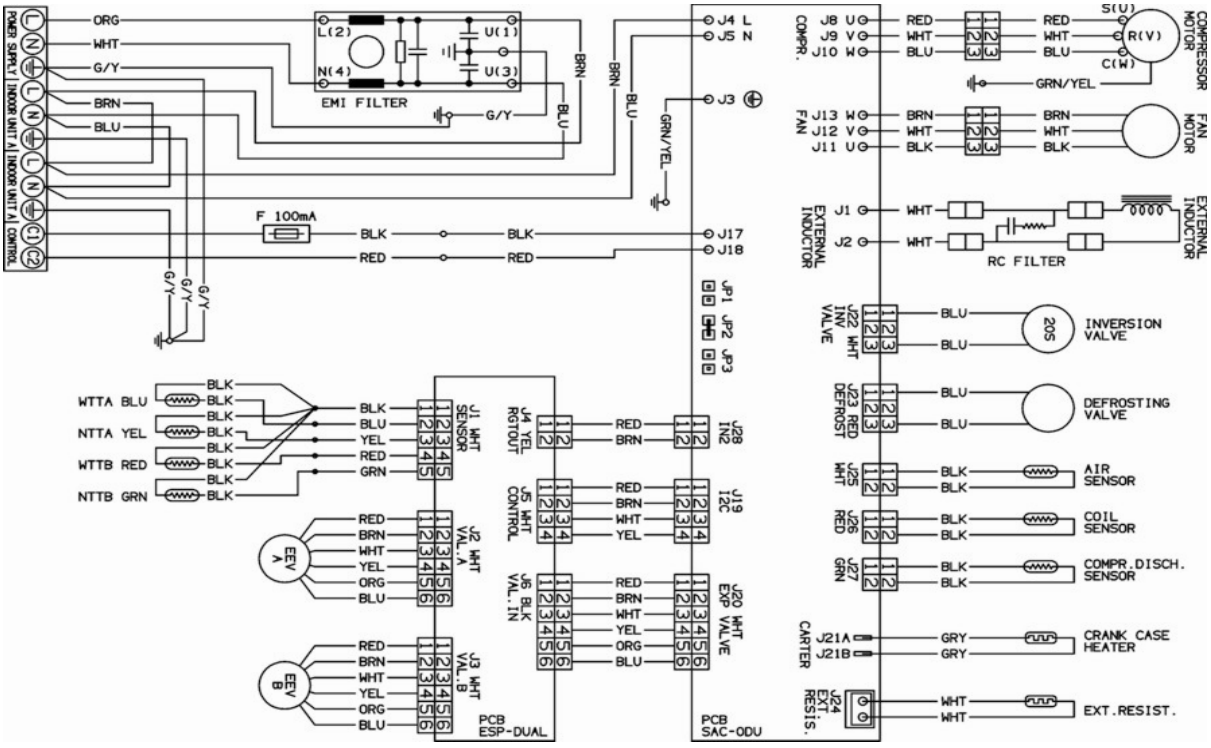
## 6-2 Electric Wiring Diagram

Outdoor unit: **GR9FI50R5IAA** **PRODUCED BEFORE DEC.31, 2010**




Outdoor unit: **GR9FI50R5IAA** **PRODUCED AFTER GEN.1, 2011**

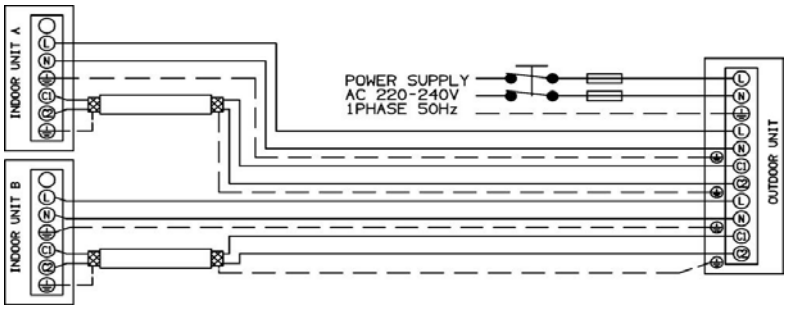
**GR9FI50R5IAB**



## 6-3 Dual Split System Wiring Diagram

Outdoor unit: **GR9FI50R5IAA** **PRODUCED BEFORE DEC.31, 2010**

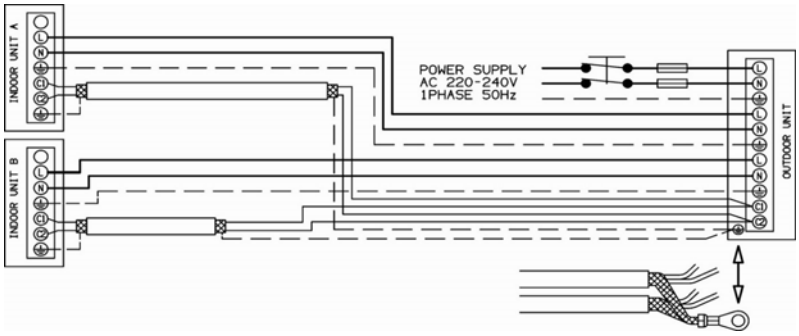
Indoor unit: **MTAF(B)IA0R5I x2**




Outdoor unit: **GR9FI50R5IAA** **PRODUCED AFTER GEN.1, 2011**

**GR9FI50R5IAB**

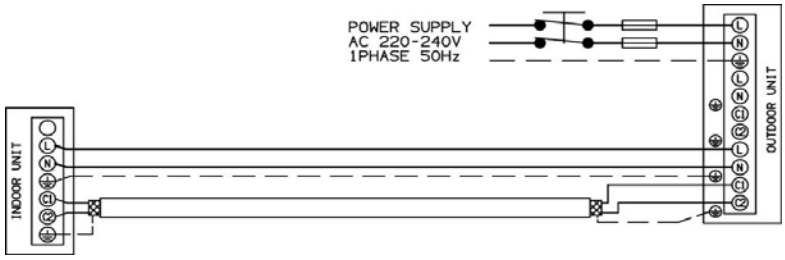
Indoor unit: **MTAF(B)IA0R5I x2**




## 6-4 Mono Split System Wiring Diagram

Outdoor unit: **GR9FI50R5IAA** **PRODUCED BEFORE DEC.31, 2010**

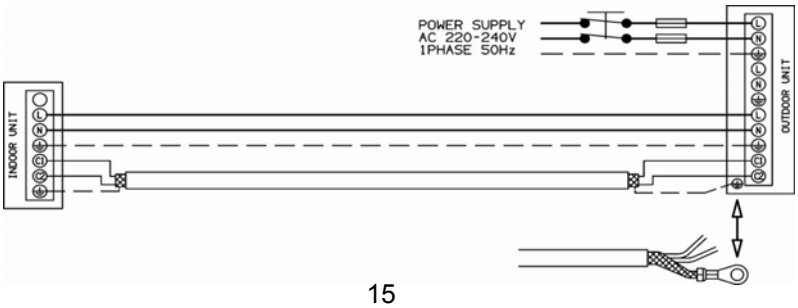
Indoor unit: **AWIBS9**




Outdoor unit: **GR9FI50R5IAA** **PRODUCED AFTER GEN.1, 2011**

**GR9FI50R5IAB**

Indoor unit: **AWIBS9**



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